What is claimed is:

1. A method for forming a device isolation layer of a semiconductor device, comprising the steps of:

forming a pad layer pattern defining a device isolation layer on a substrate;

forming a trench by etching an exposed portion of the substrate with use of the pad layer pattern as a mask;

performing an etching process to make top corners of the trench rounded;

forming a lateral oxide layer by oxidating sidewalls of the trench formed after the etching process;

forming a liner nitride layer on the lateral oxide layer;

forming an insulation layer on the liner nitride layer to fill the trench; and

planarizing the insulation layer.

2. The method as recited in claim 1, wherein the step of forming the trench proceeds by controlling an angle of the top corners of the trench to be in a range from about 30° to about 60° through the use of a gas containing at least hydrogen bromide and chlorine gas.

3. The method as recited in claim 2, wherein the step of forming the trench includes the steps of:

performing an etching process by using hydrogen bromide;

removing a native oxide layer formed after the etching process by using carbon tetrafluoride ($CF_4$) gas;

performing an etching process with use of a gas containing hydrogen bromide and chloride gas to form the trench with a predetermined depth; and

performing an etching process by using a gas containing $CF_4$ and oxygen ($O_2$) gas to purge the chloride gas from a chamber.

4. The method as recited in claim 1, wherein the etching process proceeds by employing an isotropic etching technique.

5. The method as recited in claim 4, wherein an angle of top corners of the trench ranges from about 50° to about 80° through the use of the isotropic etching technique.

6. The method as recited in claim 4, wherein the isotropic etching technique uses a gas containing $CF_4$ and $O_2$ gas.

7. The method as recited in claim 1, wherein the step of forming the lateral oxide layer proceeds by employing a dry oxidation technique.

8. The method as recited in claim 7, wherein the dry

oxidation technique is performed at a temperature of about 900°C to about 1000°C to form the lateral oxide layer with a thickness ranging from about 60 Å to about 100 Å.

9. A method for fabricating a semiconductor device, comprising the steps of:

forming a trench of which top corners are rounded by etching a surface of a substrate to a predetermined depth;

performing an etching process to the trench so that the top corners of the trench become more rounded;

forming a lateral oxide layer by oxidating sidewalls of the trench;

forming a liner nitride layer on the lateral oxide layer;

forming an insulation layer on the liner nitride layer to bury the trench;

planarizing the insulation layer until a surface of the substrate is exposed;

forming an oxide layer on the exposed surface of the substrate; and

forming a conductive layer for a gate electrode on an entire surface of a structure containing the oxide layer.

10. The method as recited in claim 9, wherein the step

of forming the oxide layer includes the steps of:

forming a screen oxide layer for a threshold voltage control on the substrate;

implanting a dopant for a threshold voltage control by using the screen oxide layer as a mask;

removing the screen oxide layer; and

forming a gate oxide layer on an exposed surface of the substrate after removing the screen oxide layer.

11. The method as recited in claim 9, wherein the lateral oxide layer is formed through a dry oxidation technique.

12. The method as recited in claim 10, wherein the screen oxide layer and the gate oxide layer are formed through a dry oxidation technique.

13. The method as recited in claim 11, wherein the lateral oxide layer is formed at a temperature ranging from about 900°C to about 1000°C with a thickness in a range from about 60 Å to about 100 Å.

14. The method as recited in claim 12, wherein the screen oxide layer is formed at a temperature ranging from

about 850°C to about 1000°C with a thickness in a range from about 50 Å to about 150 Å.

15. The method as recited in claim 12, wherein the gate oxide layer is formed at a temperature ranging from about 850°C to about 1000°C.

16. The method as recited in claim 9, wherein at the step of forming the trench of which top corners are rounded, the top corners of the trench are rounded in an angle of about 30° to about 60° with use of a gas containing at least hydrogen bromide and chlorine gas.

17. The method as recited in claim 16, wherein the step of forming the trench further includes the steps of:

performing an etching process by using hydrogen bromide;

removing a native oxide layer formed after the etching process by using $CF_4$ gas;

performing an etching process by using a gas containing hydrogen bromide and chlorine gas until the trench has a predetermined depth; and

performing an etching process with use of a gas containing $CF_4$ and $O_2$ gas to purge chlorine gas from a chamber.

18. The method as recited in claim 9, wherein the step of making the top corners of the trench more rounded proceeds by employing an isotropic etching technique.

19. The method as recited in claim 18, wherein the top corners of the trench is controlled to have an angle ranging from about 50° to about 80° through the use of the isotropic etching technique.

20. The method as recited in claim 18, wherein the isotropic etching technique proceeds by using a gas containing $CF_4$ and $O_2$ gas.